

## BAB XIII

### PERENCANAAN PONDASI STROUSS

#### 13.1 Daya Dukung Tanah terhadap Pondasi

- Data pondasi strouss :**

Dimensi  $D = 30 \text{ cm}$  ( K 225 )  
 Luas pondasi  $A_p := 0.785 \cdot 30^2 = 706.5 \text{ cm}^2$   
 Keliling dasar pondasi  $K_p := 3.14 \cdot 30 = 94.2 \text{ cm}$

$$P_{ijin} := \frac{0.6 \cdot 225 \cdot 0.785 \cdot 30^2}{3 \cdot 1000} = 31.8 \text{ ton}$$

**Daya dukung ujung tiang (konus) :**  $Q1 := \frac{A_p \cdot \text{CN}}{3}$

**Daya dukung friction (JHP) :**  $Q2 := \frac{K_p \cdot \text{JHP}}{5}$

**Daya dukung ijin :**  $Q_L = Q1 + Q2$

**Data tanah :**

Direncanakan kedalaman pondasi untuk kolom utama adalah 3 m

Tekanan konus :  $\text{CN} := 35 \text{ kg/cm}^2$

JHP ( friction ) :  $\text{JHP} := 1062 \text{ kg/cm}$

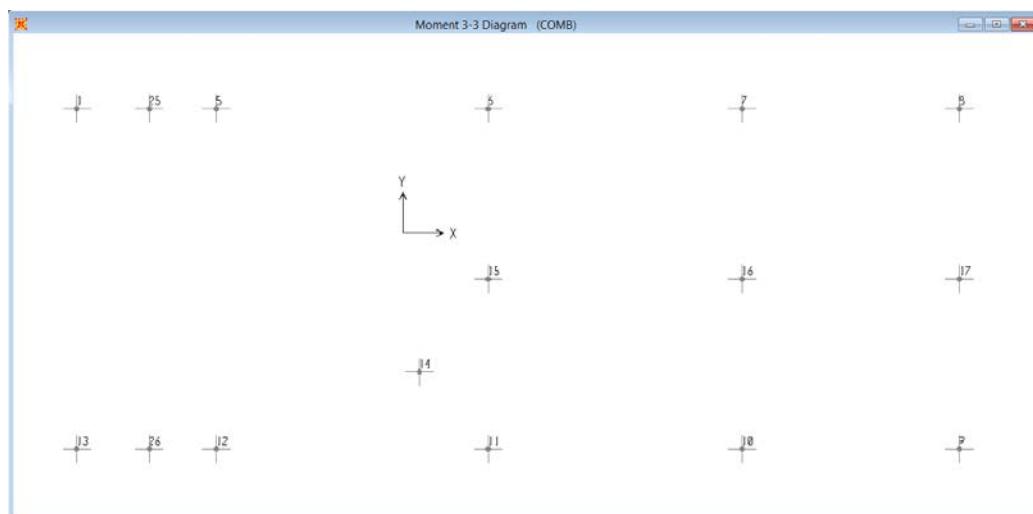
$$Q_L := \frac{A_p \cdot \text{CN}}{3} + \frac{K_p \cdot \text{JHP}}{5} = 28250.58 \text{ kg}$$

$$Q_{Lijin1} := \frac{Q_L}{1000} = 28.251 \text{ ton} \quad \blacksquare < \blacksquare \quad P_{ijin} = 31.793 \text{ ton} \quad (\text{Ok})$$

Daya dukung ijin pondasi strouss K 225 mampu menahan daya dukung ijin tanah.

#### 13.2 Kebutuhan Pondasi

**KEYPLAN PONDASI :**

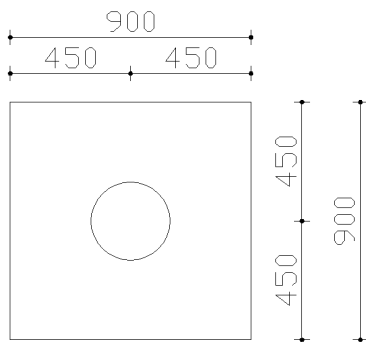


### Output Beban

TABLE: Joint Reactions							
Joint	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Tonf	Tonf	Tonf	Tonf-m	Tonf-m	Tonf-m
5	Combination	0.606	-1.315	23.980	0.472	0.390	-0.005
6	Combination	0.425	-0.678	16.013	0.076	0.284	0.002
7	Combination	-0.045	-0.726	16.219	0.065	0.162	-0.002
8	Combination	-0.189	-0.297	7.162	0.012	0.103	-0.005
9	Combination	-0.265	0.318	7.071	-0.069	0.111	0.004
10	Combination	0.209	0.354	16.175	-0.047	0.241	0.003
11	Combination	-0.343	0.333	10.309	-0.077	0.104	-0.017
12	Combination	1.029	1.187	21.385	-0.287	0.351	0.010
14	Combination	-0.429	-0.080	4.243	-0.280	-0.136	0.000
15	Combination	-0.193	0.488	29.247	-0.145	-0.066	-0.008
16	Combination	-0.729	0.377	22.539	-0.116	-0.132	0.000
17	Combination	-0.076	0.038	12.689	-0.034	-0.081	0.001

### 13.3 Kebutuhan Strouss / Titik

#### Dimensi pile cap P1 :



$$b := 0.9 \text{ m}$$

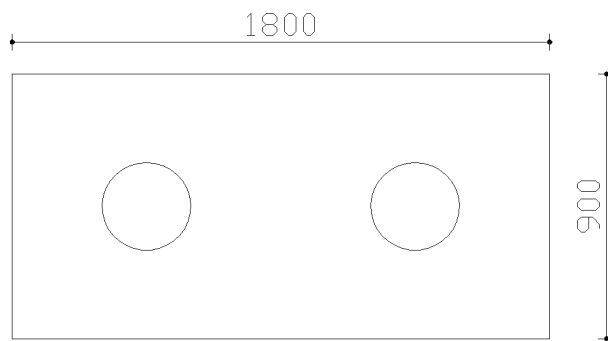
$$h := 0.9 \text{ m}$$

$$t := 0.35 \text{ m}$$

$$\gamma_{\text{beton}} := 2400 \frac{\text{kg}}{\text{m}^3}$$

$$W_p := b \cdot h \cdot t \cdot \gamma_{\text{beton}} = 680.4 \text{ kg}$$

**Dimensi pile cap P2 :**



$b := 1.8 \text{ m}$

$h := 0.9 \text{ m}$

$t := 0.35 \text{ m}$

$\gamma_{\text{beton}} := 2400 \frac{\text{kg}}{\text{m}^3}$

$W_p := b \cdot h \cdot t \cdot \gamma_{\text{beton}} = 1360.8 \text{ kg}$

**Jumlah kebutuhan strouss / titik:**

TABLE: Joint Reactions					
Joint	F3	WP	PU	QL	n
Text	Tonf	Tonf	Tonf	Tonf	
5	23.980	1.361	25.341	28.251	2
6	16.013	0.680	16.693	28.251	1
7	16.219	0.680	16.899	28.251	1
8	7.162	0.680	7.842	28.251	1
9	7.071	0.680	7.751	28.251	1
10	16.175	0.680	16.855	28.251	1
11	10.309	0.680	10.989	28.251	1
12	21.385	1.361	22.746	28.251	2
14	4.243	0.680	4.923	28.251	1
15	29.247	1.361	30.608	28.251	2
16	22.539	0.680	23.219	28.251	1
17	12.689	0.680	13.369	28.251	1

### 13.4 Kontrol Efisiensi Tiang Kelompok

$$P_{max} = (P_u / n) + ((M_x \cdot Y_{max}) / \sigma_y^2) + ((M_y \cdot X_{max}) / \sigma_x^2)$$

**Asumsi efisiensi rata-rata tiang yang bekerja kelompok 0.85 Qijin sehingga:**

TABLE: Joint Reactions														
Joint	PU	QL	n	M1	M2	M3	X MAX	Y MAX	SIGMA X2	SIGMA Y2	P MAX	EFF. QU	RASIO	KET.
Text	Tonf	Tonf		Tonf-m	Tonf-m	Tonf-m					Tonf	Tonf		
5	25.341	28.251	2	0.472	0.390	-0.005	0.45	0	0.405	0	13.104	24.013	0.546	OK
6	16.693	28.251	1	0.076	0.284	0.002	0	0	0	0	16.693	24.013	0.695	OK
7	16.899	28.251	1	0.065	0.162	-0.002	0	0	0	0	16.899	24.013	0.704	OK
8	7.842	28.251	1	0.012	0.103	-0.005	0	0	0	0	7.842	24.013	0.327	OK
9	7.751	28.251	1	-0.069	0.111	0.004	0	0	0	0	7.751	24.013	0.323	OK
10	16.855	28.251	1	-0.047	0.241	0.003	0	0	0	0	16.855	24.013	0.702	OK
11	10.989	28.251	1	-0.077	0.104	-0.017	0	0	0	0	10.989	24.013	0.458	OK
12	22.746	28.251	2	-0.287	0.351	0.010	0.45	0	0.405	0	11.763	24.013	0.490	OK
14	4.923	28.251	1	-0.280	-0.136	0.000	0	0	0	0	4.923	24.013	0.205	OK
15	30.608	28.251	2	-0.145	-0.066	-0.008	0.45	0	0.405	0	15.231	24.013	0.634	OK
16	23.219	28.251	1	-0.116	-0.132	0.000	0	0	0	0	23.219	24.013	0.967	OK
17	13.369	28.251	1	-0.034	-0.081	0.001	0	0	0	0	13.369	24.013	0.557	OK